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GB 2310977 A **WO 94/29503 A1** **US 4783646 A**

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(54) Abstract Title
Security Tag

(57) A security tag or label has a laminated construction in which at least one intermediate sheet (4, 5) is sandwiched between a pair of opposite face sheets (2, 3), and an alarm triggering device (6) is concealed within a cavity which is formed by registering apertures (7, 8) cut in the intermediate sheets (4, 5) and which is closed by the face sheets (2, 3).

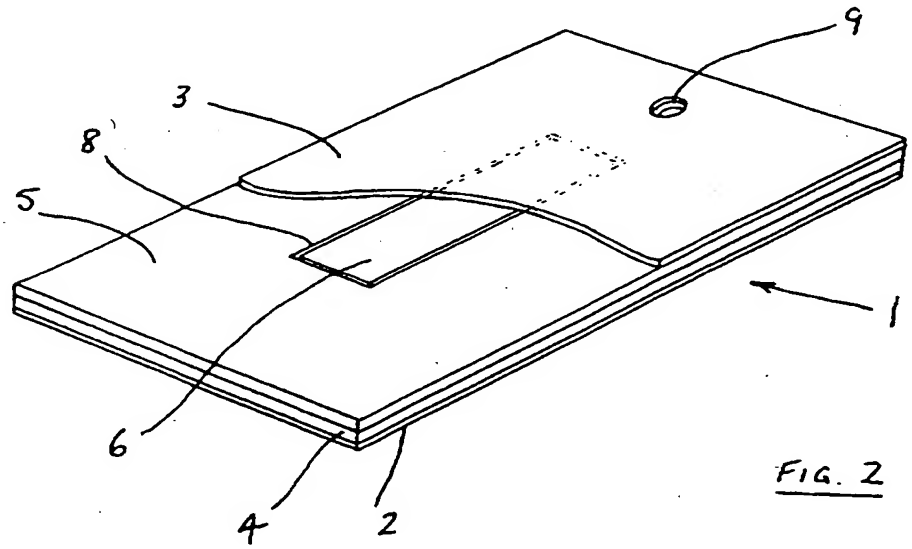

FIG. 2

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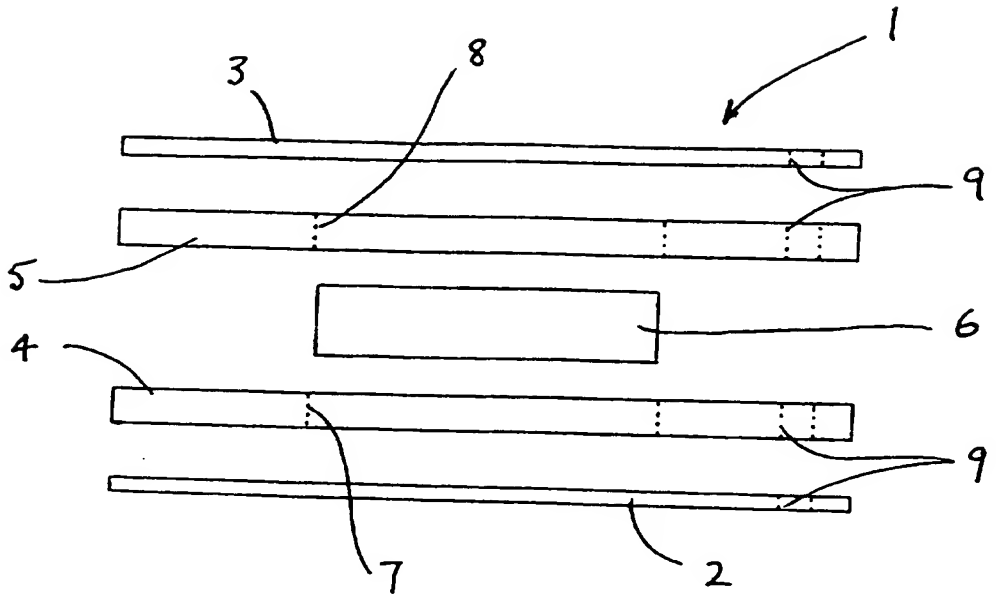

FIG. 1

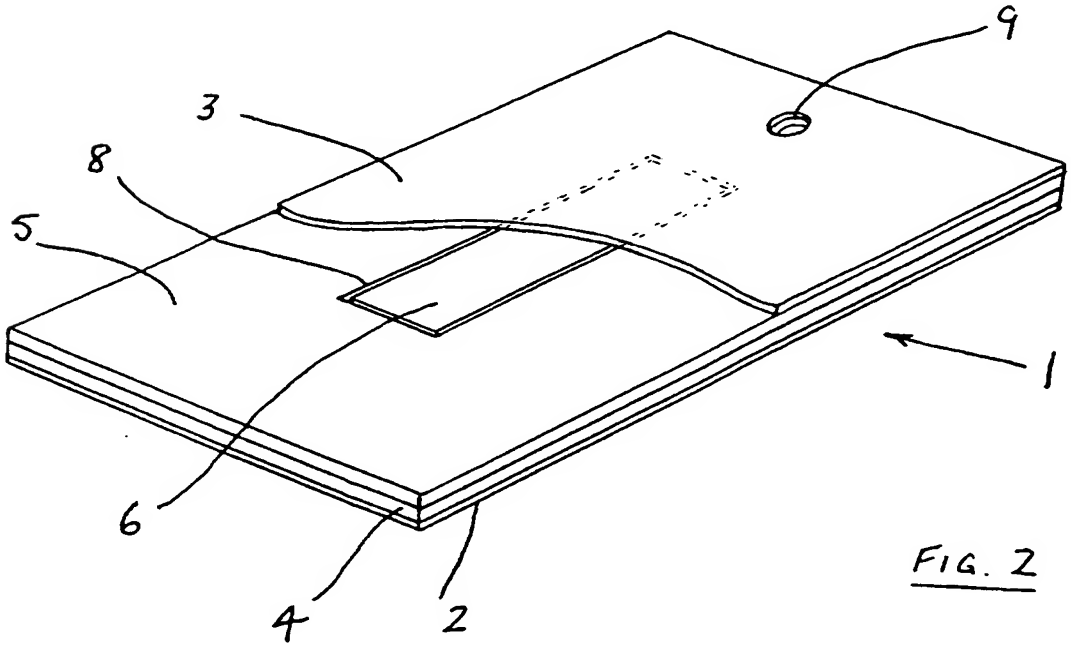

FIG. 2

SECURITY TAG AND METHOD OF MAKING THE TAG

It is well known to protect merchandise against theft from a shop or store by attaching a device to individual items of the merchandise which is operative to cause a transmitter to emit an alarm if the item is carried into a detection zone, usually at or near the shop exit, without the device first having been removed or de-activated. The device may be a simple metallic strip forming an electromagnetic aerial, a radio frequency antenna circuit or, more recently, an acousto-magnetic resonance device. The device is usually mounted in a suitable carrier which is attached to the item of merchandise in addition to the usual label or tag, and is hence readily visible as well as constituting an additional item to be attached to the merchandise.

It is known to incorporate electromagnetic and radio frequency aerials in self-adhesive labels, but this is not always entirely satisfactory and is also not particularly practical for acousto-magnetic devices.

The invention provides a security tag or label having a laminated construction in which at least one intermediate sheet is

sandwiched between a pair of opposite face sheets, the or at least one of the intermediate sheets having a cut-out area which is covered by at least one of the face sheets to define a concealed cavity within which is hidden an alarm triggering device which will respond to a signal from a transmitter to cause the transmitter to issue an alarm if the tag or label is carried into the range of the signal without having been de-activated.

Since the thickness of the intermediate sheet or sheets can be chosen such that the depth of the cavity produced will be at least equal to the thickness of the alarm triggering device, the construction in accordance with the invention enables a high quality tag or label to be produced having flat faces carrying high quality printing and/or graphics as desired, while completely concealing the alarm triggering device within it. Furthermore, the tag or label can be produced with virtually any desired outline shape.

Usually the intermediate sheet or sheets will be made of stiff cardboard, and the face sheets may be made of a suitable paper, card or plastics material.

In order to reduce the ability to detect the presence of the

cavity, and hence the alarm triggering device, in the tag or label by pressing on the face sheets, the alarm triggering device is preferably housed in a container which has a thickness substantially equal to the depth of the cavity and which is preferably dimensioned to fit closely within the cavity.

Usually, the cut-out area defining the cavity will extend completely through the or each of the interior sheets.

According to a further aspect of the invention, a method of making the security tag or label comprises cutting an aperture through the or each interior sheet, sealing one of the face sheets to one face of the interior sheet or sheets to cover one side of the aperture, placing the alarm triggering device into the aperture to rest on the face sheet, sealing the other face sheet to the opposite face of the interior sheet or sheets to cover the other side of the aperture and form a laminate containing a concealed cavity housing the alarm triggering device, and die cutting the laminate to obtain a tag or label of the desired shape.

One example of a security tag in accordance with the invention will now be described with reference to the accompanying

drawings, in which:-

Figure 1 is a diagrammatic side view of the tag (not to scale) showing the individual components of the tag separated from each other; and

Figure 2 is a perspective view of the tag with one of the face sheets cut away to reveal part of the internal cavity containing the alarm triggering device.

The tag shown in the drawings is a rectangular tag (1) formed from two outer face sheets (2, 3), two intermediate sheets (4, 5), and a self-adhesive blister capsule (6) containing an acousto-magnetic alarm triggering device of a known construction comprising a magnetic fixed pole and a movable pole which will vibrate resonantly when excited by a predetermined transmitter signal. The blister capsule containing the acousto-magnetic device is obtainable under the trade name "sensortag" from the Sensormatic Corporation, United States of America.

The two intermediate sheets (4, 5) are each made of cardboard and have a combined thickness which is not less than, and preferably substantially equal to, the thickness of the capsule (6)

containing the acousto-magnetic device. Each intermediate sheet (4, 5) has an identically sized aperture (7, 8) cut through it in a substantially central position, the apertures being of a size and shape slightly larger than the capsule (6).

The two outer face sheets (2, 3) are made of stiff card with smooth surfaces and, in this example, are thinner than the intermediate sheets (4, 5). The outer face of at least one and possibly both, of the outer sheets (2, 3) may be pre-printed as desired.

On assembly of the tag, the two intermediate sheets (4, 5) are first adhesively sealed together with the apertures (7, 8) in registry with each other, and one of the outer sheets (2) (usually the backing sheet) is adhesively fixed to one face of the combined intermediate sheets (4, 5) so as to cover the registering apertures (7, 8) on this side. The capsule (6) containing the acousto-magnetic device is then placed into the cavity defined by the registering apertures (7, 8) so as to rest on the inner surface of the face sheet (2), as can be seen in Figure 2, and the remaining face sheet (3) is then adhesively sealed to the other face of the combined intermediate sheets (4, 5) so as to cover over the cavity defined by the apertures (7,

8) and containing the capsule (6). The laminated assembly is then die cut to the required external size and shape, and a hole (9) punched through it for receiving a suitable tie for attaching the tag to an item of merchandise. In the present example the tag is shown as being rectangular, but other shapes are of course possible.

CLAIMS

1. A security tag or label having a laminated construction in which at least one intermediate sheet is sandwiched between a pair of opposite face sheets, the or at least one of the intermediate sheets having a cut-out area which is covered by at least one of the face sheets to define a concealed cavity within which is hidden an alarm triggering device which will respond to a signal from a transmitter to cause the transmitter to issue an alarm if the tag or label is carried into the range of the signal without having been de-activated.

2. A tag or label according to claim 1, in which the cut-out area defining the cavity extends completely through the or each of the intermediate sheets.

3. A tag or label according to claim 1 or claim 2, in which the alarm triggering device is housed in a container which has a thickness substantially equal to the depth of the cavity so as to reduce the ability to detect the presence of the device by pressing on the faces of the tag or label.

4. A tag or label according to any one of the preceding claims,

in which the alarm triggering device is an acousto-magnetic device.

5. A tag or label according to claim 1, substantially as described with reference to the accompanying drawings.

6. A method of making a security tag or label according to claim 1, comprising cutting an aperture through the or each intermediate sheet, sealing one of the face sheets to one face of the intermediate sheet or sheets to cover one side of the aperture, placing the alarm triggering device into the aperture to rest on the face sheet, sealing the other face sheet to the opposite face of the intermediate sheet or sheets to cover the other side of the aperture and form a laminate containing a concealed cavity housing the alarm triggering device, and die cutting the laminate to obtain a tag or label of the desired shape and size.

The Patent Office

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Claims searched:	all	**Date of search:**	22 October 1997

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.O): H4L (LADMA, LADMX, LADTA, LADTX, LADXX)

Int Cl (Ed.6): G01V 15/00; G08B 13/24

Other: Online: WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X,E	GB 2310977 A	(JARVIS PORTER) see p.4 lines 14-16	1,2,4,6
A	WO 94/29503 A1	(FRIEDRICH GRAF)	
X	US 4783646	(MATSUZAKI) see fig 4 and col 3 lines 13-17	1 at least

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.